No. 7200144

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Funk Seeds International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF seventeen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS IFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542; AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'W-332'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 28th *day of* June *in the year of our Lord one thousand nine hundred and* seventy-four

Attest:

Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

Secretary of Agriculture

FORM GR-470
(2-12-71)

UNITED STATES DEPARTMENT OF AGRICULTURE
CONSUMER AND MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

FORM APPROVED
OMB NO. 40-R3712

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

1. VARIETY NAME OR TEMPORARY DESIGNATION	2. KIND NAME	FOR OFFICIAL USE ONLY
W-332	Wheat	PVPO NUMBER 72144
3. GENUS AND SPECIES NAME	4. FAMILY NAME *(Botanical)*	FILING DATE 6-14-72 / TIME 8:00 A.M.
Triticum aestivum ssp. vulgare	Gramineae	
	5. DATE OF DETERMINATION June 1970	FEE RECEIVED $750.00 / CHARGES

6. NAME OF APPLICANT(S)	7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*	8. TELEPHONE AREA CODE AND NUMBER
Funk Bros. Seed Co.	P. O. Box 911 1300 W. Washington Street Bloomington, Illinois 61701	(309) 829-9461

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)*	10. STATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Illinois	November 1901

12. Name and mailing address of applicant representative(s), if any, to serve in this application and receive all papers:

Frank E. Robbins and John B. Goodman
CPC International Inc.
Patent Department
101 South Wacker Drive
Chicago, Illinois 60606

Mr. Leon Steele
Funk Seeds, International, Inc
dba Funk Bros. Seed Co.
P.O. Box 911
1300 W. Washington St.
Bloomington, IL 61701

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- [X] 12A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52, P.L. 91-577)*
- [X] 12B. Exhibit B, Botanical Description of the Variety
- [ ] 12C. Exhibit C, Objective Description of the Variety
- [X] 12D. Exhibit D, Data Indicative of Novelty
- [X] 12E. Exhibit E, Statement of the Basis of Applicant's Ownership

The applicant declares that a viable sample of basic seed of this variety will be deposited upon request before issuance of a certificate and will be replenished periodically in accordance with such regulations as may be applicable. *(See Section 52, P.L. 91-577).*

14A. Does the applicant(s) specify that seed of this variety be sold by variety name only as a class of certified seed? *(See Section 83(a), P.L. 91-577) (If "Yes," answer 14B and 14C below.)* [X] YES [ ] NO

14B. Does the applicant(s) specify that this variety be limited as to number of generations?	14C. If "Yes," to 14B, how many generations of production beyond breeder seed?
[X] YES [ ] NO	3

Applicant is informed that false representation herein can jeopardize protection and result in penalties.

The undersigned applicant(s) of this sexually-reproduced novel plant variety believes that the variety is distinct, uniform, and stable as required in Section 41 and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act (P.L. 91-577).

May 15 1972
(DATE)

Leon Steele Vice President
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

EXHIBIT A
ORIGIN AND BREEDING HISTORY OF THE VARIETY

I. The breeding material from which W-332 was selected was from a backcross program initiated at Colorado State University. The pedigree of W-332 is Scout *5/Agent and was derived from a backcross breeding program. The variety Scout was a recurrent parent and the variety Agent was a nonrecurrent parent. At each backcross stage, the primary selection was for seedling resistance to Puccinia recondita tritici (Leaf Rust of Wheat). Seed of the 5th backcross was obtained from Colorado State University in August, 1966.

II. In the spring of 1967, seed of the fifth backcross was vernalized and planted at Bloomington, Illinois. In September, 1967, seed from selected plants was planted in plant rows also at Bloomington, Illinois. Heavy selection pressure was applied for leaf rust resistance, strong straw and early maturity. Rows which had these and other favorable important agronomic characteristics were harvested and analyzed for quality in our quality laboratory where poor quality types were discarded.

Seed of retained rows was planted in observation plots at Bloomington in September, 1968. Selection was for rows which had a homozygous resistant reaction to leaf rust as well as other favorable agronomic and quality characteristics. Harvested, bulked seed was planted in yield plots at several locations and a seed increase block in the fall of 1969. The increase block was rogued for the following characteristics.

1. Resistant reaction to prevalent races of leaf and stem rust.
2. Uniform maturity.
3. Uniform height.
4. Awned spike.
5. Uniform phenotype.

Seed from the resultant uniform population was planted at Wiggins, Colorado for additional increase.

III. Two types of variants were observed during the process of variety purification utilizing head rows. The bulk of the head rows, 300 out of 490 were very uniform for all visual characteristics; 134 rows were very similar to the main group of head rows for all characteristics except for a slight glume color difference (bluish green) which was evident from heading until the start of maturation. This group of rows was harvested separately and will be increased separately as breeder seed then recombined with the main bulk for further increase. The remaining 56 rows were discarded for a variety of reasons, ie. height, disease susceptibility, glume color, poor stand and poor vigor being the most important.

IV. Visual observations on plantings made from uniform head row bulks have appeared to be extremely uniform.

EXHIBIT B
BOTANICAL DESCRIPTION OF THE VARIETY

I. Seed Characteristics of W-332

Seed of W-332 is red, large, hard in texture and oval in shape. The germ is small, the crease narrow and deep with rounded cheeks, and the brush is mid-sized with mid-long hair.

II. Mature Plant Description of W-332

W-332 is a winter habit variety with winterhardiness equal to Scout. W-332 is early to mid-season maturity and is mid-tall. The culms are white, mid-strong, with solid nodes and hollow internodes. W-332 is narrow leafed with the flag leaf erect and absent of pubescence. The spike is fusiform, mid-dense and awned. Awns vary from 2-8 centimeters in length and are white at maturity. Spike carriage ranges from erect to nodding. Glumes at maturity are white, narrow, and long averaging 7-8 millimeters in length. Glume shoulders are narrow and oblique. The beaks are narrow, acuminate, and predominately short in length (1 to 3 millimeters).

III. W-332 is a backcross derivative of Scout and is similar to it in most agronomic and quality characteristics. W-332 can be distinguished from Scout as it is 1-2 days later in heading and 1 inch taller. The most important differences are that W-332 has much better leaf rust resistance and stronger straw.

EXHIBIT D
DATA INDICATIVE OF NOVELTY

Visually at maturity, W-332 is very similar to Scout. Main differences are in height, date head and lodging rating (see Table I below). From a quality standpoint, W-332 and Scout are similar but small differences exist in % protein, raw sedimentation value and mixing time as measured by the mixograph (see Table II below).

TABLE I
YIELD DATA FOR W-332 AND SCOUT 1970 & 1971 DATA

	HEIGHT[1]	DATE HEAD[2]	LODGING[3]	TEST WT.	1970[4] YIELD BU/A	1971[5] YIELD BU/A
W-332	36"	134	3.0	58.0	45.8	50.0
Scout	35"	132	4.5	58.6	44.9	50.9

1) Ave. of 3 locations
2) Days after Jan. 1 - Average of 4 locations
3) 1 = Best 9 = Worst
4) Ave. of 2 locations
5) Ave. of 8 locations

TABLE II
QUALITY DATA FOR W-332 AND SCOUT 1971 DATA
(Average of 2 Locations)

	% FLOUR YIELD	% FLOUR PROTEIN	RAW SED. VALUE	MIXING TIME	LOAF VOLUME
W-332	71.7	10.9	48.3	3:10	808
Scout	71.6	11.3	52.3	2:50	810

72144

EXHIBIT D

Data Indicitive of Novelty

Novelty is based on the unique combination of the following characters:

W-332 most closely resembles 'Scout' except it is

(1) More resistant to leaf rust (2) 2 days later in maturity (3) 3 cm taller but stronger straw.

EXHIBIT D
DATA INDICATIVE OF NOVELTY

Visually at maturity, W-332 is very similar to Scout. Main differences are in date head and response to leaf rust (Puccinia recondita tritici). W-332 carries leaf rust resistance obtained from the variety Agent. This resistance is absent in Scout. From a quality standpoint, W-332 and Scout are similar.

TABLE I
AGRONOMIC DATA FOR W-332 AND SCOUT

1970 - Bloomington, Ill.	Date Head	Height	Lodging	Yield	Leaf Rust Response
Scout	144	38	-	48.0	Susceptible
W-332	148	38	-	51.0	Resistant
LSD	2.91	2.06	-	9.88	
1970 - Valmeyer, Ill.					
Scout	131	38	-	40.7	-
W-332	132	40	-	38.6	-
LSD	1.39	2.73	-	14.1	
1971 - Bloomington, Ill.					
Scout	145	42	4	20.3	-
W-332	147	43	3	17.0	-
LSD	1.80	2.12	-	11.8	
1971 - Pratt, Kansas					
Scout	128	24	-	7.0	Susceptible
W-332	133	23	-	7.7	Resistant
LSD	1.70	2.57	-		
1971 - Gruver, Texas					
Scout	134	35	-	13.3	Susceptible
W-332	139	38	-	11.0	Resistant
LSD	4.20	2.96	-	2.21	
1971 - Hartley, Texas					
Scout	127	-	-	10.8	-
W-332	127	-	-	9.9	-
LSD	1.18	-	-	3.3	
1971 - Hastings, Neb.					
Scout	146	-	2	13.0	Susceptible
W-332	149	-	2	12.8	Resistant
LSD	1.32	-		2.66	
AVERAGE:					
Scout	136	35	3	21.9	
W-332	139	36	3	21.1	

TABLE II
QUALITY DATA FOR W-332 AND SCOUT

1970 - Bloomington, Ill.	Yield	Protein	Raw Sed.	Mix. Time	Loaf Vol.
Scout	73.8	13.0	50.0	2.20	875
W-332	73.5	12.9	50.0	2.20	835
1971 - Clovis, Texas					
Scout	70.9	12.9	65.5	2.30	900
W-332	69.9	12.2	57.5	2.15	850
1971 - Webb City, Mo.					
Scout	72.2	9.7	39.0	3.10	720
W-332	73.5	9.5	39.0	4.00	765
1972 - Wyoming					
Scout	73.9	9.1	40.0	3.10	685
W-332	72.7	8.5	38.0	4.00	690

EXHIBIT E

STATEMENT OF THE BASIS OF APPLICANTS' OWNERSHIP

The novel plant variety described herein was developed by employees of applicant whose scope of employment included the development of new varieties of wheat.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-6
(2-15-73)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY

WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
FUNK SEEDS INTERNATIONAL, INC.

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
1300 W. WASHINGTON
BLOOMINGTON, ILLINOIS 61701

FOR OFFICIAL USE ONLY

PVPO NUMBER
72144

VARIETY NAME OR TEMPORARY DESIGNATION
W-332

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [2] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

[ ][ ][ ] FIRST FLOWERING [ ][ ][ ] LAST FLOWERING

4. MATURITY (*50% Flowering*):

[ ][ ] NO. OF DAYS *EARLIER* THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[0][2] NO. OF DAYS *LATER* THAN ..... [2] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (*From soil level to top of head*):

[1][1][0] CM. HIGH

[0][3] CM. TALLER THAN ..... [2] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[ ][ ] CM. SHORTER THAN ..... [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):

[2] also some blue green
1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[1] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[ ][ ] NO. OF NODES (*Originating from node above ground*)

[ ][ ] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[1] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____

[1] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[ ] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[ ] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[ ][ ] MM. LEAF WIDTH (*First leaf below flag leaf*)

[ ][ ] CM. LEAF LENGTH (*First leaf below flag leaf*):

FORM GR-470-6 (REVERSE)

11. HEAD:

[2 ~~1~~] Density: 1 = LAX 2 = DENSE *middense*

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER *(Specify)* ____

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER *(Specify)*: ____

[0 8] CM. LENGTH

[1 0] MM. WIDTH

12. GLUMES AT MATURITY:

[2] Length: 1 = SHORT *(CA. 7 mm.)* 2 = MEDIUM *(CA. 8 mm.)* 3 = LONG *(CA. 9 mm.)*

[1] Width: 1 = NARROW *(CA. 3 mm.)* 2 = MEDIUM *(CA. 3.5 mm.)* 3 = WIDE *(CA. 4 mm.)*

[2] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[1] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[ ] Phenol reaction *(See instructions)*: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER *(Specify)* ____

[0 6] MM. LENGTH

[0 3] MM. WIDTH

[3 0] GM. PER 1000 SEEDS 29.6 g/1000K

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[3] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[2] STEM RUST *(Races)* 56

[2] LEAF RUST *(Races)* same as Agent

[0] STRIPE RUST *(Races)* ____

[0] LOOSE SMUT

[1] POWDERY MILDEW

[0] BUNT

[ ] OTHER *(Specify)* ____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[1] APHID *(Bydv.)*

[1] GREEN BUG

[0] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* ____

HESSIAN FLY RACES: [0] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Scout	Seed size	Scout
Leaf size	"	Seed shape	"
Leaf color	"	Coleoptile elongation	"
Leaf carriage	"	Seedling pigmentation	"

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

(1) Letter of Dec 7, 1973 from Roy E. Miskin